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EXAMINER

GREY, CHRISTOPHER

ART UNIT	PAPER NUMBER
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2667

DATE MAILED: 12/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/872,412

Applicant(s)

BANKS ET AL.

Examiner

Christopher P Grey

Art Unit

2667

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f):
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are being objected to. New corrected drawings are required in this application because of informal (hand-written) drawings (Figs 2, 4, 5-11). Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to this Office action.

Specification

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: World Wide Name (claim 4) must be fully defined/described.

Claim Objections

3. Claim 13 is objected to because of the following informalities: Claim 13 is claimed to be dependant on claim 13 (improper). Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 10, 11, 12, 20 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Muller et al. (US 6016310)

Claim 1, 29 Muller et al. (Muller 'hereinafter') discloses a communication network (element 130 in Fig 1) with 2 devices (switches- element 211 in Fig 2) connected via a plurality of ports (elements 106-108 and 111-113 in Fig 1) by a plurality of links (elements 115-117 in Fig 1). Muller discloses a trunk group (element 140 in Fig 1) to which a number of selected links are a part of. Muller discloses a forwarding database containing forwarding information (designated ports for transmission). Muller also discloses a learning circuit configured to modify (select trunking ports to be trunking masters) the forwarding database. Constant updates of the forwarding database trigger the packets to be forwarded to all selected ports of the trunk designated for the second device (disclosed in Col 1 lines 63-Col 2 line 12 and disclosed in Col 9 lines 3-16 and Col 3 lines 25-31).

Claim 2 Muller discloses ports (elements 106-108 and 111-113 in fig 1) coupled to each other creating an inter switch link (elements 115-117 in fig 1 and Col 1 lines 13-25).

Claim 10 Muller discloses a trunk group (element 140 in Fig 1) to which a number of selected links are a part of. Muller discloses a forwarding database containing forwarding information (designated ports for transmission). Muller also discloses a learning circuit configured to modify (select trunking ports to be trunking masters) the forwarding database. Constant updates of the forwarding database trigger the packets to be forwarded to all selected ports of the trunk (trunking master ports) designated for

the second device (disclosed in Col 1 lines 63-Col 2 line 12 and disclosed in Col 9 lines 3-16).

Claim 11 Muller discloses each input port (trunking master port) receiving a forwarding decision indicating the outbound ports upon which the corresponding packet should be transmitted. Also prioritization information (possible list) may be included in the forwarding decision to facilitate packet traffic through the switch (Col 5 lines 33-49). That forwarding information is transmitted via a link for that period of time from an output port of a first switch to an input port of a second switch.

Claim 12 Muller discloses load balancing, which involves the spreading of packets over different links of a trunk group (Col 6 lines 7-14).

Claim 20 Muller et al. (Muller 'hereinafter') discloses a communication network (element 130 in Fig 1) with 2 devices (switches- element 211 in Fig 2) connected via a plurality of ports (elements 106-108 and 111-113 in Fig 1) by a plurality of links (elements 115-117 in Fig 1). Muller discloses a group of links (element 140 in Fig 1) through which two switches are connected. Muller discloses selecting ports by which to transmit (disclosed in Col 1 lines 63-Col 2 line 12 and disclosed in Col 9 lines 3-16).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3, 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller et al. (US 6016310) in view of Kadambi et al. (US 6104696)

Claim 3 Muller discloses a trunk learning and filtering process, whereby information from a register (link parameters) is used to select the trunk and port. These registers contain information including the port number, trunk number field (first identifier) and trunk size field. This information is sent to a learning and filtering block where selection information is gathered in a forwarding port mask and ultimately sent back (exchanged) to the input port that requested the forwarding decision (Col 7 lines 59- Col 8 lines 42), indicating a successful exchange. Muller does not disclose determining whether a second identifier exists, the second identifier having a higher value than that of the first.

Kadambi et al. (Kadambi 'hereinafter') discloses a system and method of sending packets between ports on trunked network switches, where a first switch has a plurality of ports couples to a plurality of ports on a second switch. The packet is received on the first switch and a lookup (request) is performed using a look up table (link parameters). A trunk connection between the first and second switch is identified (first identifier), and then a rules tag bit is identified (second identifier), as disclosed in Col 2 line 46- Col 3 line 32.

Therefore it would have been obvious for one skilled in the art at the time of the invention to modify the method disclosed by Muller which discloses adding a new port to a trunk and the routing of packets, with an aspect of the invention disclosed by Kadambi

which discloses selecting a new port based on searching and using two identifiers. The motivation for these modifications is to increase the processing speed and prevent delay packet forwarding (disclosed in Col 2 lines 18-43).

Claim 4 Muller discloses each subsystem supporting gigabit ethernet ports, fast Ethernet ports and Ethernet ports (disclosed in Col 3 line 65- Col 4 line 20), which World Wide Name (64 bit identifier) is a subdivision of.

The motivation is the same as that for claim 3.

Claim 13 Muller does not disclose the other of the pair of trunking master ports comprising a receive port queuing frames received over the trunked group.

Kadambi discloses queuing incoming packet and further more assigning priority (Col 31 lines 23-43).

The motivation is the same as that for claim 3

6. Claims 5-7, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller et al. (US 6016310) in view of Bertin et al. (US 6400681)

Claim 5 Muller discloses selecting and learning a trunk and ports but does not disclose determining a one way skew value for the links associated with the trunked group and determining whether the new port can be added to the trunked group based on the one way skew value determined.

Bertin et al. (Bertin 'hereinafter') discloses a method involving packet switching between a plurality of nodes (switches) interconnected with transmission links. Bertin discloses finding a path for a connection request. Bertin discloses a topology database

being constantly updated, this database containing information about link properties such as the propagation delay (Col 9 lines 32-60). This propagation delay is maintained for each link (skew values). The topological updates are needed for path selection that may involve the activation of new links (Col 8 lines 29-44).

Therefore it would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the method disclosed by Muller, who discloses adding a new port to a trunk and the routing of packets, with the aspect of the invention disclosed by Bertin, who discloses finding a path/route through maintaining a database with information (propagation delay) about links. The motivation for the mentioned modifications is to reduce end to end delay and increase data throughput (disclosed in Col 1 lines 44-59)

Claim 6 Muller discloses selecting and learning a trunk and ports but does not disclose, determining whether a link associated with the new port communicates frames at a speed substantially similar to other links in the trunked group; and determining that the one way skew value is within a predetermined range.

Bertin discloses a topology database being constantly updated, this database containing information about link properties such as the transmission medium and speed (Col 9 lines 32-60). The transmission speed is maintained for each link. The topological updates are needed for path selection that may involve the activation of new links (Col 8 lines 29-44). Bertin also discloses a quality of service requirement where the end to end delay transit delay and the end to end delay variation (skew values) are parameters (Col 12 lines 18-32).

The motivation is the same as that for claim 5

Claim 7 Muller does not disclose measuring a difference in propagation delay between the links associated with the trunked group.

Bertin discloses a topology database being constantly updated, this database containing information about link properties such as the propagation delay (Col 9 lines 32-60). The propagation delay is maintained for each link.

The motivation is the same as that for claim 5

Claim 14 Muller discloses routing packets over a trunk but does not disclose doing so prior to performing link parameter initialization.

Bertin discloses routing data packet over a trunk and in addition (in no particular order) updating information and maintaining a network topology including link utilization (Col 7 lines 24-40)

The motivation is the same as for claim 5

7. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller et al. (US 6016310) in view of Bertin et al. (US 6400681) in further view of Aramaki (US 5383181)

Claim 8 The combined inventions of Muller and Bertin do not disclose sending a MARK sequence from particular ones of the first ports to particular ones of the second ports; and determining a timestamp associated with receiving the MARK sequence sent.

Aramaki discloses a packet switching system having input ports supplied with input packets and output ports producing packets. Each input port has connected to it a

time stamper that produces a time stamp packet (Mark sequence). This time stamping is used to determine a delay (propagation) as disclosed in Col 2line 56- Col 4 line 5.

Therefore it would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the method disclosed by the combined inventions, that disclose adding a new port to a trunk and the routing of packets, with the aspect of the invention disclosed by Aramaki that discloses a method of sending packets through a switch using time stamping. The motivation for the modification is to reduce packet delay time (Col 2 lines 48-50).

Claim 9 The combined inventions do not disclose receiving a MARK sequence sent from particular ones of the first ports, associating a clock timestamp value responsive to receiving the MARK sequence, and sending a response to the first switch, the response including the date timestamp value.

The combined inventions disclose a topology database being constantly updated, this database containing information about link properties such as the propagation delay (Col 9 lines 32-60). This propagation delay is maintained for each link in each node (responsive).

Aramaki discloses a packet switching system having input ports supplied with input packets and output ports producing packets. Each input port has connected to it a time stamper that produces a time stamp packet (Mark sequence). This time stamping is used to determine a delay (propagation).

The motivation is the same as that for claim 8

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8. Claims 15-19, 21, 22, 25, 26, 28, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller et al. (US 6016310) in view of Chapman et al. (US 6628609)

Claim 15 Muller et al. (Muller 'hereinafter') discloses a communication network (element 130 in Fig 1) with 2 devices (switches- element 211 in Fig 2) connected via a plurality of ports (elements 106-108 and 111-113 in Fig 1) by a plurality of links (elements 115-117 in Fig 1). One skilled in the art can appreciate a communication network involving switches being computer implemented. Muller discloses a trunk group (element 140 in Fig 1) to which a number of selected links are a part of. Muller discloses a forwarding database containing forwarding information (designated ports for transmission). Muller also discloses a learning circuit configured to modify (select transmit ports to be trunking masters) the forwarding database. Constant updates of the forwarding database trigger the packets to be forwarded to all selected ports of the trunk designated for the second device (disclosed in Col 1 lines 63-Col 2 line 12 and disclosed in Col 9 lines 3-16). Muller discloses load balancing, which involves the spreading of packets over different links of a trunk group (Col 6 lines 7-14). Muller does not disclose queuing the traffic load received at the transmit ports through a queue associated with the master transmit port.

Chapman et al. (Chapman 'hereinafter') discloses the processing of data packets through a switch containing a plurality of input ports and output ports and a switch fabric capable of interconnecting the input port with a certain output. A control mechanism is implemented to find a logical pathway such that queuing is involved, where at least one

queue is provided to hold the data unit received at the input port. The data packets are released to a switch fabric controller and routed to the output ports (disclosed in Col 3 lines 1-19 and Col 3 line 65- Col 4line 14).

Therefore it would have been obvious to one of the ordinary skill in the art at the time if the invention to modify the method disclosed by Muller, who discloses adding a new port to a trunk and the routing of packets, with the aspect of the invention disclosed by Chapman, who discloses the act of queuing amongst switches. The motivation for this modification is to achieve more control of the routing of data through a switch and to limit the possibility of congestion (disclosed in Col 2 lines 50-54).

Claim 16 Muller discloses a switch receiving packets at the input ports (elements 111-113 in Fig 1) after being routed through the trunking group (element 140 in Fig 1). Muller does not disclose queuing the traffic load received through a queue associated with the master receive port in an order received.

Chapman discloses queuing being implemented based on priority, where one skilled in the art can appreciate priority as in an order received (Col 13 lines 45-56).

The motivation is the same as that for claim 15.

Claim 17 Muller discloses each input port (trunking master port) receiving a forwarding decision indicating the outbound ports upon which the corresponding packet should be transmitted. Also prioritization information (possible list) may be included in the forwarding decision to facilitate packet traffic through the switch (Col 5 lines 33-49). That forwarding information is transmitted via a link for that period of time from an output port of a first switch to an input port of a second switch.

The motivation is the same as that for claim 15.

Claim 18 Muller discloses a communication network (see fig 1) but does not disclose the switches being a part of a fabric in a communication network.

Chapman discloses a switch fabric (disclosed in Col 3 lines 1-19). The motivation is the same as that for claim 15

Claim 19 Muller discloses packets (frames) entering or leaving a network switch (disclosed in Col 4 lines 41-54). The motivation is the same as that for claim 15.

Claim 21, 22 Muller discloses load balancing (Col 6 lines 7-14) but does not disclose a first queuing logic coupled to the transmit port, the first queuing logic enabling frames received at the first ports to be routed through the transmit port and across the group so that the selected ones of the links transmit the frames.

Chapman discloses the processing of data packets through a switch containing a plurality of input ports and output ports and a switch fabric capable of interconnecting the input port with a certain output. A control mechanism is implemented to find a logical pathway such that queuing is involved, where at least one queue (must be coupled to both input and output ports) is provided to hold the data unit received at the input port. The data packets are released to a switch fabric controller and routed to the output ports (disclosed in Col 3 lines 1-19 and Col 3 line 65- Col 4line 14). Chapman discloses queuing being implemented based on priority, where one skilled in the art can appreciate priority as in an order received (Col 13 lines 45-56).

Therefore it would have been obvious to one of the ordinary skill in the art at the time if the invention to modify the method disclosed by Muller, who discloses adding a

new port to a trunk and the routing of packets, with the aspect of the invention disclosed by Chapman, who discloses the act of queuing amongst switches. The motivation for this modification is to achieve more control of the routing of data through a switch and to limit the possibility of congestion (disclosed in Col 2 lines 50-54).

Claim 25, 26 Muller discloses e_ports (elements 106-108 and 111-113 in fig 1) coupled to each other creating an inter switch link (elements 115-117 in fig 1 and Col 1 lines 13-25).

The motivation is that same as that for claim 21 and 22.

Claim 28 Muller does not disclose the switches being a part of a fabric in a communication network.

Chapman discloses a switch fabric (disclosed in Col 3 lines 1-19). The motivation is the same as that for claim 21.

Claim 30 Muller et al. (Muller 'hereinafter') discloses a communication network (element 130 in Fig 1) with 2 devices (switches- element 211 in Fig 2) connected via a plurality of ports (elements 106-108 and 111-113 in Fig 1) by a plurality of links (elements 115-117 in Fig 1). Muller discloses a group of links (element 140 in Fig 1) through which two switches are connected. Muller discloses selecting ports by which to transmit (disclosed in Col 1 lines 63-Col 2 line 12 and disclosed in Col 9 lines 3-16). Muller also discloses load balancing (Col 6 lines 7-14). Muller does not disclose queuing the traffic load received at the transmit ports through a queue associated with the master transmit port

Bertin discloses a control mechanism being implemented to find a logical pathway/links such that queuing is involved, where at least one queue (must be coupled to both input and output ports) is provided to hold the data unit received at the input port (disclosed in Col 3 lines 1-19 and Col 3 line 65- Col 4line 14).

The motivation for this modification is to achieve more control of the routing of data through a switch and to limit the possibility of congestion (disclosed in Col 2 lines 50-54).

9. Claim 23, 24 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller and Chapman in further view of Bertin

Claim 23 The combination of Muller and Chapman's inventions does not disclose a timer binding a particular list associated with the transmit port to a particular link in the group for a period of time to ensure in order delivery of frames transmitted across the group.

Bertin discloses a topology database being constantly updated, this database containing information (list) about link properties such as the propagation delay (Col 9 lines 32-60). The propagation delay is maintained for each link. One skilled in that art can appreciate a means (timer) for maintaining the propagation delay.

The motivation to combine the teachings of Bertin with the teachings of the combination of Muller and Chapman is to reduce end to end delay and increase data throughput (disclosed in Col 1 lines 44-59)

Claim 24 The combination of inventions does not disclose a programmable timeout constant register.

Betrin discloses a time to live parameter (disclosed in Col 17 line 29-50). The motivation is the same as that for claim 23.

Claim 27 The combination of inventions does not disclose a one way link timer.

Bertin discloses a propagation delay being maintained for each link. One skilled in that art can appreciate a means (timer) for maintaining the propagation delay. The motivation is the same as that for claim 23.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(a) Hunter et al. (US 6731599) discloses a method/apparatus that involved trunking in a communication device where a trunk group is identified and active number of ports is determined.

(b) Bare (US 6556541) discloses a method involving the communication of data between a number of switches, where these switches cooperate through load balancing.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher P Grey whose telephone number is (571)272-3160. The examiner can normally be reached on 6:30-3:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (571)272-3179. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher Grey

Examiner

Art Unit 2667

C. Grey 12/10/04

A. Qureshi
12/9/04
AFSAR QURESHI
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